Patent Claims

1. An inhalation therapy device

comprising an oscillatable membrane (1) for nebulising a liquid (3),

comprising an oscillation generating device (6, 7) having at least one connecting means (8, 9) for supplying an activation signal and by means of which said membrane (1) is caused to oscillate when the activation signal is supplied such that a liquid disposed on one side of the membrane is nebulised through said membrane and is present on the other side of the membrane as an aerosol, and

comprising a control means (10) from which an activation signal can be supplied to the at least one connecting means (8, 9) of the oscillation generating device (6, 7) such that said oscillation generating device (6, 7) causes the membrane (1) to oscillate,

characterised in that

a detection device (13) is provided which detects at least one electric parameter of the oscillatable structure comprising the membrane (1) and the oscillation generating device (6, 7) and which determines the presence of a liquid to be nebulised based on the at least one parameter.

2. An inhalation therapy device according to claim 1, **characterised in that**

the control means (10) alternatingly generates activation signals with at least two different frequencies (f_1, f_2) and

the detection device (13) determines the presence of a liquid to be nebulised based on the detected values of the at least one parameter at the at least two different frequencies (f_1, f_2).

3. An inhalation therapy device according to claim 2, **characterised in that** at least one first activation signal having a first frequency (f_1) causes nebulisation of the liquid.

4. An inhalation therapy device according to one of claims 2 or 3, **characterised in that** the time intervals in which a first activation signal having a first frequency (f_1)

is generated are longer, preferably by at least a factor of 10, than the time intervals in which an activation signal having a second frequency (f_2) is generated.

5. An inhalation therapy device according to one of claims 1 to 4, **characterised in that** the detected values are stored for an evaluation over a longer period of time.

6. An inhalation therapy device according to one of claims 1 to 5, **characterised in that**

if the detection device (13) determines that no liquid (3) is present,

said detection device (13)

prevents the supply of activation signals by the control means (10) to the oscillation generating device (6, 7), and/or

triggers the generation of an optical and/or audio signal by a signal emitting means (14) in order to indicate that no liquid (3) is present.

7. An inhalation therapy device according to claim 6, **characterised in that**

the emitted audio signal is a short sound signal and/or a sound sequence and/or recorded or synthesised voice signals.

8. An inhalation therapy device according to one of the preceding claims, **characterised in that**

the oscillation generating device (6, 7) comprises an electromechanical transducer unit (7), in particular a piezoelectric element.

9. An inhalation therapy device according to claim 8, **characterised in that**

the oscillation generating device (6, 7) comprises a support unit (6) to which the electromechanical transducer unit (7) and the membrane (1) are attached.

10. An inhalation therapy device according to one of the preceding claims, **characterised in that**

an energy supply unit for the inhalation device is integrated in the control means (10).

11. An inhalation therapy device according to one of the preceding claims, **characterised in that**

the at least one electric parameter is the current consumption, the power consumption or the current/voltage phase shift.

12. An inhalation therapy method for an inhalation therapy device according to one of claims 1 to 11, comprising the following steps:

switching on the inhalation therapy device;

supplying activation signals from the control means (10) to the oscillation generating device (6, 7) in order to nebulise the liquid (3);

detecting at least one electric parameter of the oscillatable structure comprising the membrane (1) and the oscillation generating device (6, 7); and

determining whether or not liquid (3) is still present based on the detected parameter of the oscillatable structure (1, 6, 7).

13. An inhalation therapy method for an inhalation therapy device according to one of claims 2 to 11, comprising the following steps:

switching on the inhalation therapy device;

supplying activation signals having at least two different frequencies (f_1, f_2) from the control means (10) to the oscillation generating device (6, 7), the liquid (3) being nebulised at at least one frequency (f_1);

detecting values of at least one electric parameter of the oscillatable structure comprising the membrane (1) and the oscillation generating device (6, 7) at the at least two different frequencies (f_1, f_2); and

determining whether or not liquid (3) is present based on the values of the detected parameter of the oscillatable structure (1, 6, 7) at at least one of the at least two different frequencies.

14. An inhalation therapy method for an inhalation therapy device according to claim 12 or 13, **characterised in that** said method further comprises the following steps:

continuing to supply the activation signals from the control means (10) to the oscillation generating device (6, 7) in order to continue nebulisation of the liquid (3) if it is determined that liquid (3) is present; and

stopping the supply of activation signals from the control means (10) to the oscillation generating device (6, 7) and/or emission of an optical and/or audio signal if it is determined that no liquid (3) is present.

15. An inhalation therapy method according to one of claims 12 or 13, **characterised in that** the at least one electric parameter is the current consumption, the power consumption or the current/voltage phase shift.